branches of engineering; we have invented nearly all the important things, but the great development of these things has gone out of the hands of the amateurs of our nation. It is because our statesmen are Gallios who "care for none of these things," because they know nothing of science. Huxley failed to move them. The German Emperor's fosterage of engineering only amuses them, and hence our manufacturers blame everything except their own ignorance for their loss of trade. Prof. Exner wants to put the technically educated man in charge of all departments of Government which have to do with manufacture and distribution; with the use of all tools, including, we presume, guns and other weapons of destruction. He does not seem to know what is so obvious to us in England, that the Ministers in charge of departments must have had such a training of another kind that it is impossible for them also to be engineers. All we ask is that they shall know just a little about science, so that they may be able to take scientific advice. But alas! even this condition of things is remote. However important it would be to have men of the quality of engineers as their advisers or in charge of the various parts of a great department, there are qualifications more important—power to coax the Treasury for necessary money; social qualities such as come from good birth and enable one to keep one's superiors favourably disposed; qualities created by official life which enable one to work obediently as part of the official machine and never get into a rage; the knowledge that if ever there is a conflict between official law and a law of nature, it is the official law which must be obeyed. For our reform what is wanted is a cataclysm, rather destructive, but not too much so.

J. P.

NOTES.

We see with deep regret the announcement of the death of Prof. A. Cornu, whose numerous researches in physics are known throughout the scientific world. An account of the life and work of this distinguished investigator will appear in another issue of Nature.

By the death of Lord Kimberley, the office of Chancellor of the University of London becomes vacant. Of the names of those who have been mentioned as likely to fill it with advantage that of Lord Rayleigh is obviously the most appropriate. The new teaching University of London must achieve a high reputation on scientific lines or it will fail of its mission; a mere politician as a figure-head would be an anachronism.

Prof. Ray Lankester, in a letter to the *Times* of April 15, raises a new point in relation to the Rhodes scholars at Oxford. He states that the University of Oxford keeps its college residences, lecture rooms and laboratories open for only twenty-one weeks out of the fifty-two which make up a year; so that "it will not be worth while for a young German of ability to sacrifice three or four of the best years of his life to dawdle through the Oxford half-time system, even when paid 300*l.* a year for doing so." If it be true that the laboratories are shut for thirty-one weeks in the year, then certainly the sooner William Morris's idea of dispersing the inhabitants and consecrating Oxford to Death and Beauty, the better for others as well as the Germans to whom Prof. Lankester refers.

The high esteem in which the late Sir John Donnelly was held was shown by the large body of mourners that attended his funeral at Brompton Cemetery on Friday last besides the members of the family. The Lord President of the Committee of Council on Education was represented; and among other mourners were the Clerk to the Council, the vice-president and officers of the Board of Education, representatives of the Victoria and Albert Museum, Geological Survey and Museum of Practical Geology, Royal College of Science, and Solar Physics Observatory. The Royal Society, Royal Academy, and the London Technical Education Board were also represented. Among the wreaths was one bearing a card on which was printed: "A tribute of affectionate regard from the vice-president of the committee of council, officers and staff of the (late) Department of Science and Art, including the Victoria and Albert Museum, the Royal Colleges of Science and Art, and the Geological Survey and Museum, 11 April, 1902." Another wreath was from the Dublin Science and Art Institution: "In token of affectionate remembrance and sincere regret from those who served under Sir John Donnelly." Other wreaths were sent by Sir Trevor and Lady Lawrence, Sir Lawrence and Lady Alma-Tadema, and many others. The Victoria and Albert Museum was closed on the morning of the funeral.

Dr. J. Larmor, Sec. R.S., and Dr. Oliver Lodge, F.R.S., have been elected members of the Athenæum Club under the rule which empowers the annual election by the committee of nine persons "of distinguished eminence in science, literature, the arts, or for public services."

At the meeting of the American Philosophical Society held on April 4, the following were elected to membership:—*Residents of the United States*—Dr. J. A. Brashear, Dr. Andrew Carnegie, Prof. W. B. Clark, Prof. Hermann Collitz, Mr. G. K. Gilbert, President A. T. Hadley, Prof. G. E. Hale, Prof. P. Haupt, Prof. A. A. Michelson, Mr. C. Hart Merriam, Prof. T. W. Richards, Prof. F. E. Schelling, Prof. R. H. Thurston, Mr. B. C. Tilghman, Prof. R. S. Woodward. *Foreign Residents*—Prof. A. H. Becquerel, Prof. J. G. Darboux, Sir Michael Foster, K.C.B., F.R.S., Prof. G. Johnstone Stoney, F.R.S., Prof. S. P. Thompson, F.R.S.

As already announced, the German Association of Natural Philosophers and Physicians will hold its seventy-fourth annual congress at Carlsbad on September 21–28. As on former occasions, the rule that lectures and debates may be carried on in any language of the world will be followed, and foreign visitors will be accorded the same privileges as the ordinary members of the association enjoy. It is estimated that between 6000 and 8000 representatives of natural philosophy and medicine will gather at Carlsbad, and great preparations have already been made there to receive the members and friends of this famous association. Nearly all the principal professors of the Berlin, Vienna, Prague and most of the other continental universities and important colleges will be present, and twenty-eight different branches of ancient and modern science will form the programme for the lectures and debates. At the exhibition of scientific objects, which will be held in connection with the congress, no charge will be made to exhibitors for the space required, nor will any entrance fee be asked from visitors. Inquiries or letters should be addressed to "The 74th Congress of Natural Philosophers at Carlsbad."

In reply to a question relating to the North Sea Fisheries, Mr. Gerald Balfour stated in the House of Commons on Monday that the Government has agreed to take part in the international scheme of investigations connected with fishery problems in the North Sea and adjacent waters as proposed by the conferences held at Stockholm and Christiania, and Parliament will be asked to make a grant to defray the cost of the British share of these investigations. These funds will be administered by a departmental committee with the advice o scientific experts. The details of the investigations will no doubt be finally settled at the forthcoming meeting of the inter national council at Copenhagen, at which Great Britain will be represented, but the date of which has not yet been fixed. The Board of Trade has also appointed a committee under a minute dated August 13, 1901, to inquire and report as to the best means by which the State or local authorities can assist scientific research as applied to problems affecting the fisheries of Great Britain and Ireland, and, in particular, whether the object in view would best be attained by the creation of one central body or department acting for England, Scotland and Ireland, or by means of separate departments or agencies in each of the three countries. Quite apart from this important question of scientific research, the Board of Trade has, with the assistance of another committee, considered how the present system of collecting fishery statistics in England and Wales could be improved and extended. The chief recommendations of this committee are referred to below.

THE *Times* has published the recommendations of the interdepartmental committee appointed "to inquire into the system of collecting fishery statistics in England and Wales, and to report how it could be improved and extended, and what additional cost (if any) would be entailed thereby, having special regard to the opinion expressed by the Select Committee of the House of Commons on Sea Fisheries, 1893, and the proposals of the Stockholm Conference, 1899." Among the suggestions are:—the extension and improvement of the present system of employing collectors at the fishing ports with the view of obtaining fuller details relating to fishery statistics; the preparation of separate returns as to the amount of fish caught in Icelandic and Faroese waters and in the Bay of Biscay and on such other new fishing grounds as it may from time to time be found desirable and practicable to distinguish; and that conger eels, dabs, gurnards, lemon soles, skate and rays, and whiting should be separately distinguished. The present report does not extend to statistics of salmon or fresh-water fish. The adoption of the recommendations would involve an annual expenditure on the collection of fishery statistics of 2135*l.*, or 1435*l.* beyond what is provided at the present time, and a further annual expenditure of at least 1000*l.* for the supervision of collectors and for obtaining the additional information already described.

NEWS has come to hand that Dr. Elliot Smith, professor of Anatomy in the Medical School at Cairo, has been given two months' leave of absence to investigate at once some human remains discovered at Girga, in Upper Egypt. The graves containing the remains are said to consist of a continuous series extending over an interval of at least 8000 years, which represent the most archaic of prehistoric periods. The bodies are so well preserved, owing doubtless to the dryness of the atmosphere where they were interred and to the perfection of interment, that not only can the hair, nails and ligaments be made out, but the muscles and nerves. In almost every case the brain is said to be preserved, and the climax has been reached in two examples where the eyes with lens in good condition are present, and in others in which Dr. Elliot Smith has already observed the limb plexures and great splanchnic nerve. There are also now unearthed a series of later prehistoric graves, ranging throughout the first fifteen dynasties, others of the eighteenth, and yet others of the Ptolemaic and early and recent Coptic periods. This vast "cemetery" has been excavated by Dr. Reisner for the University of California, and we can but congratulate him and the Egyptian Government on having secured the services of so competent an anthropotomist as Dr. Elliot Smith, whose full report will be eagerly awaited.

A MEMORIAL to the late Dr. John Anderson, F.R.S., the first superintendent of the Indian Museum at Calcutta, has recently been erected in the upper eastern verandah of the main Chowringhi building. The memorial is in the form of a full-face medallion portrait in bronze, and is the work of the eminent Scottish academician, D. W. Stevenson. It is completed by a brass tablet, upon which the following words are inscribed:—"John Anderson, M.D., F.R.S., First Superintendent of the Indian Museum, 1865–1886. Besides organising and arranging the zoological and archæological sections of this Museum, he made large collections and many discoveries in Yunnan and Mergui, and achieved enduring distinction by his original contributions to vertebrate zoology. (Presented to the Museum by his widow and friends, 1901.)" Referring to the memorial, the *Englishman* remarks:—"As the gift of Dr. Anderson's friends, the location of the memorial is happily chosen; but from a wider point of view the museum itself—at least in its zoological and archæological sections—is *monumentum aere perennius* of Dr. Anderson's work in India, for although the institution has considerably developed since his time, it has done so strictly along the lines—well in advance of their day—that he laid down and fashioned. Dr. Anderson will also be remembered as one of the earliest advocates of a zoological garden for Calcutta, and as having greatly helped to shape that institution also when it was started." Every naturalist will be glad to know that Dr. Anderson's valuable work has been commemorated in this way. His labours could not easily be forgotten even if no memorial had been erected, but students unfamiliar with his career should be reminded of the great work he accomplished. In connection with this subject it is worth mention that the volume on "The Mammals of Egypt," on which Dr. Anderson was busily engaged when a brief illness unexpectedly terminated his useful life, will be published during the present year. This will be the second volume of Dr. Anderson's important work on the zoology of Egypt, and it will be similar in every respect to the first volume, on the reptiles of Egypt.

IN a discussion on West Africa at the monthly dinner of the London Chamber of Commerce on April 9, Sir Harry Johnston remarked that we were much behind Germany and France in respect of the scientific examination of the territories under our control. Writing to the *Times* upon the subject, he defends the Foreign and Colonial Offices from charges of want of sympathy with purely scientific work (examination of rainfall, fauna, flora, geology, minerals, &c.) in our African possessions by pointing out that they were often prevented from carrying out such work by the reluctance of the Treasury to expend national moneys in that direction. Referring to the Uganda Railway he says, "if in past decades we had been allowed to spend, say, 20,000*l.* in the scientific examination of East Africa, the knowledge thus acquired might have enabled us from omniscience to make the Uganda Railway for some half a million less money. Lacking this prior knowledge, those engaged in the construction of this remarkable line have done their very best to avoid mistakes and unnecessary expenditure, and the result is wholly creditable to the Office which employed them. The Treasury is sometimes unsympathetic towards scientific research, but the Treasury, after all, is only an exponent of the national will. It is the nation—the Empire—at large which is so indifferent to the value of scientific research, more especially in the domains of anthropology, zoology, botany, geology, and meteorology, that it cares little for the scientific examination of its territories, new and old. Some of this work can be done by private enterprise and generosity. But much might be accomplished by the Government if the Treasury would but agree. I am not asking for an expenditure of a million sterling per annum, or of even one of those unconsidered hundred thousand pounds cheerfully spent without blinking on an armed and punitive expedition. Twenty thousand pounds wisely expended on three scientific expeditions in West Africa, East Africa, and British Central Africa would probably give us all the information we require as to the products, soils, minerals, natural history and human races of our tropical African dominions.

A NUMBER of prizes, varying in value from 800 to 8000 francs, are offered by the Belgian Royal Academy of Medicine for researches in various branches of pathological and medical science. The largest prize is offered for discoveries relating to the diseases of the nervous centres, with special reference to epilepsy, and for a really valuable discovery, such as a curative remedy for epilepsy; two premiums, one being of 5000 francs, may be given in addition to the prize of 8000 francs.

WE have received from Mr. J. Baxendell the report of the Fernley Observatory, Southport, for the year 1901. Mr. Baxendell continues his useful experiments and comparisons with the view of improving the records of self-recording instruments, especially those obtained from anemometers of various patterns. We quote the following climatological data from this important observatory:—Extremes of shade temperature, 88°·4 in July, 19°·1 in January and December; highest solar temperature, 129°·1, in August. Total rainfall, 26·7 inches, nearly 7·5 inches below the average. Bright sunshine (Campbell-Stokes recorder), 1738 hours. The report contains an interesting comparison of climatological statistics with upwards of fifty other health resorts.

MR. W. E. COOKE, Government Astronomer of Western Australia, has published a paper on the climate of that colony, from observations made during the years 1876–1899, containing a large number of valuable tables showing the monthly means and extremes of the various elements, illustrated by maps. The latter show that the records refer mostly to stations on or near the coast, and that the inland districts are, to a great extent, still unrepresented. In addition to the climatological tables, general descriptions of the types of weather most frequently experienced, and of the climate, with especial reference to that of Perth, are given in the text, and will be found very useful to all interested in the meteorological features of the country. Taking Perth to represent the south-west and south coastal stations, the mean monthly temperature is 64°·9, the highest extreme being 116°·7 and the lowest 31°·2. The mean annual rainfall is 32·9 inches. Within the tropics, records of 110° are not infrequent, the absolute maximum being 123°, at Onslow, in February, 1897. Thunderstorms, accompanied by heavy rain, are frequently experienced; the heaviest fall ever recorded was 36·49 inches, near Cossack, on April 2–3, 1898. On the other hand, only 0·73 inch was recorded in this district during twenty months ending January, 1892.

A NEW application of the electric furnace which may prove to be of great practical importance was described by Mr. C. B. Jacobs in a paper read before the New York section of the Society of Chemical Industry. The raw material for most of the barium compounds in common use is barytes, the natural sulphate, and this is usually converted into other barium compounds by treating it with coal or coke in a reverberatory furnace and then working up the crude barium sulphide thus obtained. It has been found that when barium sulphate and sulphide are heated together in suitable proportions at the temperature of the electric furnace, the sulphur is completely eliminated as sulphur dioxide and barium oxide remains, the conversion being so complete that only 2 to 3 per cent. of barytes remains unacted upon, as against 25 to 45 per cent. by the older process. By lixiviating with water and crystallising out, barium hydrate is obtained at once, containing only about 1 per cent. of impurities, chiefly barium sulphydrate. From this all the other barium salts are readily obtained. The electrical energy required for this process is got from the Niagara Falls, and the plant in use at the present time is turning out sixty tons per day. The fields into which it is finding its way are the tanning industry, the white pigment and dry colour trades, the purification of water for industrial purposes, and general manufacturing chemistry. The largest consumption, however, is in the beet sugar industry, for the recovery of the sugar remaining uncrystallised in the molasses. Barium hydrate is an ideal substance for the softening of water for boiler purposes, and its general introduction in place of the methods at present in use is only a question of price.

THE structure and design of electric automobiles are at present attracting much attention from electrical engineers. Sir H. P. Maxim in a lecture recently delivered before the Automobile Club of New York, commented on the progress made in the design of accumulators. The capacity of the cells per kg. of battery weight has been doubled, while the life of the plates has been increased 25 per cent. by the improvements made within the last three years. The best type of accumulator cell can now be utilised for running 8000 kms. before renewal of the plates is necessary. The electric automobile, in Maxim's opinion, is superior to all other types of automobile for general use. It is only likely to be supplanted by the petroleum or light spirit type of vehicle, where economy is the chief consideration, or where the distances to be covered are beyond the range of the electrically propelled car. Many of the latest types of electric automobile possess motors designed to act as dynamos for recharging the battery when the car is running downhill. A German engineer, Th. Müller, of Nuremberg, has been investigating the reality of the advantages claimed for this type of vehicle, and the details of his inquiry will be found in the *Zeits. f. Accumulatoren und Elementen-kunde* for March 1, 1902. The increased amount of copper required for motors, intended to act under such conditions as dynamos, and the greater complexity of their design, are held by Müller to quite counterbalance the gain of 10 to 15 per cent. which is all that results in the distance capacity of the cars.

A STATISTICAL comparison of developments of German and British trade in recent years is made in a long article in the *Times* of April 3. Though the writer seeks to show that there is little cause for uneasiness, he admits that Germany has advanced more rapidly than Great Britain in many departments of industry and commence. Especially is this true as regards chemical goods and electrical machinery, but no particulars as to these advances are given. So many industries depend upon chemical science for their means of progress that the present advantage which Germany possesses in applied chemistry is likely to produce far-reaching effects. Upon this subject the writer remarks:—"Years of research and theoretical training had made the German chemist *facile princeps.* Even in Great Britain, in France and in the States most leaders of the chemical trades and most assistants are Germans by birth or training; of Germany the chemical trades are a speciality. The technical colleges had likewise bred a highly efficient army of electrical, metallurgical and mining engineers who would soon find ample scope for their talents. In addition, the German mind has always been scholarly by inclination and open by habit. The self-sufficiency and the indifference to foreign doings, so characteristic of the British trader, never have been features of the German. On the contrary, he has always been open to foreign influences, and eager to adopt foreign ways." In the metallurgical trades, also, it is stated that Great Britain has not kept abreast of the times. During the last ten years of last century our iron production only rose from 7,900,000 to 9,421,000 tons, or, say, 17½ per cent., whereas that of Germany went in the same interval from 4,658,000 to 8,143,000 tons, and, therefore, increased more than 75 per cent. If the rate of progress be maintained on both sides, the German iron production will be greater than the British in about three years' time. The general conclusion reached is that though as a nation Great Britain has continued to advance, Germany has made more rapid progress.

THE observatory on the summit of Mont Blanc, such a familiar object to all who visit Chamonix, has furnished M. Jean Binot with the means for making bacteriological investigations at the highest altitude yet explored. His researches are published in the *Comptes rendus* of the Paris Academy of Sciences. As was to be anticipated, the air on the summit away from the observatory contains scarcely any bacteria whatever, only from 4 to 11 being detected in as much as a thousand litres, whilst in somewhat smaller volumes of air frequently none at all were discoverable. As a rule, at lower altitudes, the number of bacteria present increased; thus at the Plan de l'Aiguille 14, whilst at the Montanvert 49, were found in a thousand litres. Inside the observatory, in which M. Binot tells us he spent five days, from 260 to 540 microbes were found in the same volume of air; these bacteria were doubtless introduced during the temporary invasion of the building by M. Binot and his companions. The investigations were not, however, confined to the air on the top of the mountain, but included also bacterial examinations of freshly fallen snow, old snow, ice on the surface and below, glacier water, and mountain streams. Freshly fallen snow, even when sampled in large quantities, frequently contained no bacteria whatever, whilst in snow which had lain for some time usually only from one to two individuals were discoverable per cubic centimetre; at the foot of the glaciers the surface snow contained rather more, the number varying from 6 to 65 per c.c. at the Mer de Glace. Glacier water is usually very pure, and, like the glacier-ice from which it is derived, was found to contain a number of yeasts and some streptothrix; but whilst high up such water contained but from 3 to 8 bacteria per c.c., a stream at the foot of the Glacier des Bossons contained 95, whilst the water of the river Arve at Chamonix was found to have as many as 7550 per c.c. Altogether M. Binot examined 121 samples of air, ice, snow and water, and isolated no less than 300 different varieties of microbes, one-third of which number he was able to identify as having been already studied and described, and the residue are being carefully investigated by him at the present time. Of great interest is the author's remarkable discovery of a virulent race of pyocyaneus bacilli in ice on the top of Mont Blanc; he also isolated from water a vibrio highly pathogenic to animals. Even the alluring and beautifully clear and crystalline spring water on the Montanvert road was condemned by being found to contain a dozen virulent colon bacilli in a cubic centimetre. Doubtless this pollution was due to the herds of cattle which graze on the mountain pastures.

IN the *Biologisches Centralblatt* for April, Dr. A. Bethe makes a further contribution to the discussion as to the nature of the "homing" instinct of bees and ants.

PART vi. of the second volume of the *Annals* of the South African Museum is devoted to a revision of the species of certain groups of the scorpions of the country, in the course of which several new forms are described.

IN the April number of *The Entomologist*, Miss Sharpe completes her list of the butterflies and moths collected by Dr. Christy in Nigeria. It is remarkable that a species hitherto believed peculiar to Aden should recur in West Africa.

THE annual report of the Indian Museum, Calcutta, for 1900-1901, states that important progress has been made in the improvement of the exhibited series, in the cataloguing of the reserve collections, and in the exchange and distribution of duplicate specimens. The acquisitions have been numerous, and, for the first time, the exhibited specimens have been adequately labelled in large type. The plan of replacing stuffed and spirit specimens of snakes by coloured casts is being carried out as rapidly as possible. A gallery has been reserved for economic zoology. Mr. T. H. Holland, of the Indian Geological Survey, has joined the board of trustees, in place of Mr. R. D. Oldham, retired.

THAT acquired characters may be inherited is suggested by Dr. Kidd's investigations into the arrangement of the hair on the human forehead, of which an account is given in the April issue of the *Journal of Anatomy and Physiology*. Certain lines of divisions appear in most cases, which are regarded as derived from the style of "parting" adopted by the parents. In the same publication, Mr. W. L. H. Duckworth, from the study of certain peculiarities in the skulls of a gibbon and an aboriginal Australian, is led to believe that in certain respects the man-like apes have attained a higher platform of specialisation than man himself.

IN the *Entomologist's Monthly Magazine* for April, Mr. C. W. Dale gives an account of the occurrence of the "mazarine blue" butterfly (*Lycaena acis*, or *Nomiades semiargus*) in Britain. According to the author, no specimens have been taken in our islands for more than twenty years; it is suggested that its extermination there may have been due to the attacks of hymenopterous parasites, although there is no evidence that this was the case. Never abundant, the species has been recorded from twenty-one English and Welsh counties, in several cases only on the evidence of a single specimen.

A MEMOIR in the *Quarterly Journal of Microscopical Science* describes the results of an investigation into the morphology of the skull of the bony fishes, based on an examination of its development in the three-spined stickleback. In addition to noting many points connected with the details of skull-structure, the author, Mr. H. H. Swinnerton, finds that his study of the anatomy and developmental history of the head-skeleton shows that the sharks and rays on the one hand, and the bony fishes and ganoids on the other, appear to have had a common ancestor, whose chief structural features are briefly indicated. It is added that the term "hyostylic," commonly used to indicate the mode of suspension of the lower jaw to the cranium in the latter group, does not adequately express the true state of the case. In another paper in the same journal dealing with what are commonly called "fishes," Dr. E. Warren discusses the structure of the teeth of the lampreys and hag-fishes. He remarks at the outset that those who regard these creatures as degenerate descendants of ordinary fishes would expect to find in their horny teeth remnants of the calcified structure of those of other vertebrates. He finds, however, no definite evidence of such degeneration, but adds that if they are actually degenerate they have reverted to a condition which probably preceded the development of the "placoid" scales of the sharks and rays.

AN interesting article in the March number of the *American Naturalist*, by Dr. H. P. Torrey, describes a peculiar phenomenon seen on the Californian coast during the past summer. Early in July a red streak was noticeable in the sea off San Pedro Harbour, which during the next few days approached the shore and divided into several patches of many acres in extent. On the 16th these patches reached the shore, where they were the cause of a most unusual display of phosphorescence. The discoloration and phosphorescence of the water were due to the presence of swarms of flagellate animalcules. "On the 20th, four days after the red (characteristically a muddy vermilion) streak had reached the shore, a most sickening odour arose from the water along the beach. During the night, on a beach about 400 feet long, a large number of animals were lef by the tide. Among them were several hundred holothurians, several specimens of two species of sting-ray, two species of guitar-fishes (Rhinobatus), two cestracionts, two dog-fishes, a red perch, a large number of smelts, and several octopi." The "red water" occurred for at least two hundred miles along the coast and extended several miles out to sea; it had not disappeared at the beginning of September. Wherever it occurred food-fishes were scarce; but the small harbour-fishes and invertebrates of the "plankton" were unaffected. Towards the end of July, the animalcule Noctiluca appeared in swarms and devoured the animalcules of the red water. A somewhat similar visitation is reported to have occurred five hundred miles further south in the seventies, but has never before been known in California.

An interesting case of peloria was furnished by a Cattleya which Dr. Masters showed at a recent meeting of the scientific committee of the Royal Horticultural Society. This abnormal flower appeared on a plant produced by crossing *Cattleya Schröderae* with *Brassavola Digbyana*. It showed three regular sepals, and alternating with these three petals, alike in size, colour and shape. The column was normal.

A recent number of *Science* records the proceedings of a number of prominent American botanists, now organised under the name of "The Botanists of the Central States." The meetings were held at the University of Chicago, under the chairmanship of Prof. J. M. Coulter. Among the papers read were the following:—F. C. Newcombe, "The sensory area of the roots of land plants"; H. L. Lyon, "The phylogeny of the cotyledon"; C. A. King, "Fertilisation and some accompanying phenomena in *Araiospora pulchra*"; H. S. Reed, "The ecology of a glacial lake"; R. A. Harper, "Binucleate cells in certain Hymenomycetes."

A catalogue of plants has been received from Mr. H. P. Kelsey, the proprietor of the Highlands Nursery, N. Carolina, U.S. Mr. Kelsey has successfully undertaken to bring before Americans the wealth and richness of their native flora. The nurseries are situated at a height of 4000 feet, and naturally lend themselves to the production of such alpine or subalpine genera as Rhododendron, Kalmia, Tsuga, Leucothœ and Andromeda. To the cosmopolitan grower of interesting or little-known plants, this list of hardy American specialities will suggest many future possibilities.

Various explanations have been put forward to account for the production of cleistogamic flowers. No simple explanation has been offered which would cover the phenomenon in all cases; indeed, it is much more probable that they are formed in response to different stimuli, or for different purposes. In the second volume of the *Publications of the University of Pennsylvania*, Dr. C. H. Shaw discusses the formation of cleistogamic flowers in two American species of Polygala. One of these, *Polygala polygama*, produces both aërial and subterranean forms. The latter occur in early summer at the same time as the normal flowers, while the former are found later, on shoots which may have borne open flowers and which at this time develop a geotropic tendency. The morphological differentiation of the aërial cleistogamic flowers is intermediate between that of the other two varieties. The formation of the cleistogamic flowers seems to be correlated with the economic and rapid production of seed, for the normal flowers fail to a great extent to set seed, and require a longer time to mature it.

From two leaflets which we have received we notice that Kodak, Ltd., have two novelties which they have recently brought out. One of these consists of a kodak made especially for the use of glass plates alone, and fitted with the usual neat and simple movements and adjustments, many of which can be operated with one hand. These cameras are made in two sizes, for quarter and 5 × 4 plates, and both are fitted with Bausch and Lomb's lenses and shutters. The other new announcement is the number two stereo kodak for taking stereoscopic or single pictures 3½ × 3½ in. on cartridge film. The camera is of the box pattern, measuring 8 × 4⅝ × 6 in., and requires no unfolding when a photograph is about to be taken. The shutters are ever-set, and are simultaneously operated for time or instantaneous exposures by separate levers. A third lever actuates three stops, and its position indicates which stop is in front of the lens.

The additions to the Zoological Society's Gardens during the past week include a Caracal (*Felis caracal*) from South Africa, presented by Mr. F. C. Longbourne; a Suricate (*Suricata tetradactyla*) from South Africa, presented by Miss Philippe Stephenson; three Common Vipers (*Vipera berus*), British, presented by Mr. A. Old; a Diana Monkey (*Cercopithecus diana*) from West Africa, deposited; two Alpine Choughs (*Pyrrhocorax alpinus*), European, purchased; six Shaw's Gerbilles (*Gerbillus shawi*), three Black Swans (*Cygnus atratus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

Total Eclipse of the Moon (April 22).—There will be a total eclipse of the moon on the evening of Tuesday, April 22, which will be partly visible in England. The total phase will be reached before moonrise at Greenwich (7h. 5m.), so that only the latter part of the phenomenon can be observed. The following particulars are for Greenwich mean time:—

	h.	m.
First contact with penumbra	3	50·3
,, ,, shadow	5	0·2
Beginning of total phase	6	10·2
Middle of eclipse	6	52·8
End of total phase	7	35·4
Last contact with shadow	8	45·4
,, ,, penumbra	9	55·3

The first contact with the shadow occurs at 89° from the north point of the moon's limb towards the east; the last contact at 60° towards the west.

Magnitude of eclipse (moon's diameter = 1) = 1·337.

In consequence of the eclipse taking place near the time of moonrise, it will be interesting, wherever the surroundings permit, to observe the setting sun and eclipsed moon simultaneously at opposite points of the horizon.

New Variable Stars.—4 (1902) *Geminorum*.—Prof. Ceraski announces the variability of the star BD + 20°·1875, determined from photographs taken at Moscow. Its position is

$$\left.\begin{array}{l}\text{R.A.} = 7^{\text{h.}}\ 32^{\text{m.}}\ 37^{\text{s.}}{\cdot}0 \\ \text{Decl.} = +\ 20^{\circ}\ 45'{\cdot}3\end{array}\right\}(1855).$$

The magnitude is usually stated to be 9·0, and at present the brightness is increasing.

5 (1902) *Lyrae*.—In the *Astronomische Nachrichten* (Bd. 158, No. 3783), Mr. A. Stanley Williams announces the discovery of a new variable in Lyra whose coordinates are

$$\left.\begin{array}{l}\text{R.A.} = 18^{\text{h.}}\ 56^{\text{m.}}\ 12^{\text{s.}} \\ \text{Decl.} = +\ 37^{\circ}\ 18'{\cdot}7\end{array}\right\}(1855).$$

All the observations up to the present time are photographic, from plates taken with a 4·4-inch portrait lens.

The magnitude appears to vary between 10·6 and 12·0. From the dates of the minima it would seem to have a period of about two-thirds of a year, and in this case the next maximum should occur in or about the month of July 1902.